

# Boost Efficiency and Cut emissions – Improve Fuel Economy in Three Steps with Advanced Engine Oils

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India has set ambitious goals to reduce emissions and improve fuel efficiency, in line with its commitment to combat climate change and transition toward a more sustainable energy future. India has deployed various measures to meet these goals, such as, implementation of Bharat Stage VI (BS-VI) emission standards, Corporate Average Fuel Efficiency (CAFE) standards, launch of the National Hydrogen Mission to explore the use of green hydrogen as clean energy alternative, and electrification in the automotive sector. The research on sustainable fuels and lubricants plays a crucial role in both the automotive and industrial sectors for reducing emissions and improving fuel efficiency, which is often a more cost-effective way than modifying the hardware of a vehicle.

The use of advanced engine oils, formulated to low viscosities with cutting-edge technology of performance packages and viscosity index improvers, delivers a substantial contribution to vehicle efficiency. OEMs have successfully adopted SAE 0W-16 and SAE 0W-20 viscosity grades in first fill and service fill engine oils for passenger cars. Using lower viscosity grades like SAE 0W-8 and SAE 0W-12 bears the risk to engine durability and would require an engine re-design. Therefore, the better option is to improve the fuel efficiency within the same SAE grade.

Evonik has identified three steps to improve efficiency in the same viscosity grade, with the result of CO<sub>2</sub> emission reductions. The first step requires the use of advanced viscosity index improvers that provide an ultra-high viscosity index and have a shear stability that optimizes the oil's viscosity profile to maximum efficiency. The second step is the use of lower viscosity base oils, thus further increasing the viscosity index of the engine oil. The third step is to switch from gasoline/diesel performance packages to low-viscosity gasoline-only performance packages. Evonik has investigated the impact of this 'three-step approach' in a state-of-the-art engine under realistic dynamic and static engine operation conditions up to full load. The three-step approach maximizes the fuel efficiency in the same SAE grade by over 1% without compromising oil consumption. The three-step approach is not limited to traditional internal combustion engines and can equally be applied in hybrid engines as well as hydrogen internal combustion engines.

## About the Author



Dr. Rhishikesh V. Gokhale is currently Global Technology Manager for Engine Oil additive Segment at Evonik Oil Additives based out of Darmstadt, Germany. He has been with Evonik Oil Additives since 2011 holding various roles in research and development, technical service and customer relations. Dr. Gokhale is a Ph.D. polymer and peptide chemist by education.